A NEW OPERATION FOR INTESTINAL STENOSES.

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It has been the experience of all surgeons that resections of the colon are followed by a high rate of mortality. Wölfler, in a paper read before the German Surgical Society in 1896, stated that 54 per cent. of such operations on the large and small intestines resulted in death. Körte, in nineteen cases of colonic resection for cancer, had seven deaths; but as six of the nineteen cases were in the ileocæcal region, and as all of the six recovered, there remained thirteen cases involving other portions of the colon with a mortality of nearly 54 per cent. The fatality rate differs, therefore, with the location of the disease. The greatest success has been attained in the ileocæcal region, and next to that with the sigmoid, while radical procedures on the transverse colon and the colonic flexures have been exceedingly disastrous.

The success attained in the ileocæcal region has probably been due, in large part, to the ability to isolate that part of the gut and to protect the abdominal cavity from infection. It may be, too, that the intestinal contents, which in case of obstruction in that region accumulate in the ileum, are less virulent than those which collect in the colon when the obstruction is farther down. However that may be, a careful study of these operations leaves little doubt that the greatest danger is the exposure of the abdominal cavity to infection from the cut bowel. Besides this, the causes of the high rate of mortality are to be found in the general condition of many of these patients when they are operated upon, the diseased condition of the gut above the seat of obstruction, the changes which take place in the intestinal contents from long retention and from their mixture with secretions from the congested mucous membrane, and from the attempt to make end-to-end anastomoses in bowels differing enormously in size. Many of these operations, too, have to be made at a time when the partial chronic obstruction has become complete, when the patient has become exhausted by a long, painful struggle, and when the bowels have become acutely congested and inflamed.

The operation becomes then urgent, and the surgeon may hardly allow himself time for a thorough examination of the case, and cannot delay action until he has brought the patient into a better condition. Under such circumstances operations are done at a great disadvantage, and many patients die who might have been saved if operated on at an earlier period. If the bowel is resected, when the abdomen is open the greatest difficulty is experienced in preventing infection. The whole intestine, except that part below the seat of stenosis, is full of long retained fæces, which have acquired a highly virulent quality. To empty the gut requires a long time, during which the intestines are more or less exposed. If an end-to-end junction of the cut bowel is attempted, the surgeon is puzzled by the difference in caliber and in quality of the two ends, for the proximal end is dilated often to a diameter of three or five inches and has walls which are knobby and parchment-like, while the distal end is contracted to half of the normal size and is soft and pliable.

The German surgeons have sought in various ways to overcome these difficulties. Mikulicz was the first to abandon the " one time" operation and to resort to a method of operating in which the gut in one operation was fastened outside of the abdominal cavity, in a second resected, and in a third repaired. His method is as follows:

First of all, the abdomen is opened and the diseased area freed from its attachments and stripped of its blood-vessels.

The mesenteric glands are removed and the rents in the mesentery repaired.

The two limbs of the affected coil are then brought parallel to each other and fastened together with Lembert stitches. The tumor and three or four inches of the intestine are next brought out of the wound and the abdomen closed snugly around them. The parts to be removed having been deprived of their blood-vessels mortify, and in two or three days are ready for removal and are cut off. A glass tube inserted into the afferent branch carries off the fæcal discharge. Two weeks later, the spur between the two bowels is divided by a clamp, the adhesions formed between the two rendering the operation without danger to the other viscera. Of twelve cases thus treated, ten recovered.

Hochenegg has had success with a similar operation, without, however, resorting to that unnecessary measure of depriving the gut of its blood-vessels, and thus inducing gangrene. He brings the tumor well out of the abdomen, prevents its retraction by passing a fold of iodoform gauze through the mesentery, and closes the abdominal wound around the bowel with sutures. After a few hours he makes a small opening in the distended afferent limb, inserts a glass tube, and empties the intestine. At the end of ten or twelve days the abdomen is reopened, the tumor and adjacent parts of the gut are excised, and the two ends united with circular suture.

The objections to both of these procedures are the multiple operations necessary to their completion.

The deliberate production of gangrene in Mikulicz's procedure seems to me unnecessary and useless, while the cure of a false anus by clamping the spur is tedious and imperfect when it does occur, and often fails to take place even when the spur has been destroyed. In that case the surgeon has to resort again to a laparotomy and to resection of the bowel. Hochenegg's procedure necessitates an opening of the abdomen and a junction of the bowel in an exhausted patient, who has barely recovered from a laparotomy.

That these secondary operations are by no means devoid of danger is proven conclusively by Wölfler's statistics, in which a mortality of 22 per cent. is reported in operations for the cure of false anus.

Stimulated last winter by a fatal case of colonic resection for cancer, I have given a good deal of study to the technique of these operations. It has seemed to me that the existing methods of procedure might be very much improved, and I venture to bring before the profession a method of operation which, I hope, may prove in practice what it seems to me to promise in theory.

The main and essential things in operations for colonic cancer are:

First. The protection of the abdominal cavity from infection by deferring the evacuation of the intestinal contents until the abdominal wound has been completely closed and hermetically sealed. This can be done only by bringing the tumor out of the abdomen and fastening it there while the gut is opened.

Second. The avoidance of all serious secondary operations which would bring new risk to the patient. I propose to accomplish these objects in the following manner:

Given a tumor or a stenosis of the colon, every effort should be made to locate exactly the seat of disease, as the knowledge of its location enables the surgeon to make the abdominal incision at the most favorable point. For this reason, such cases should be carefully studied beforehand, and never operated on without the most careful investigation. If the tumor can be felt, its location is plain. In the many cases in which it cannot be felt, we may, nevertheless, locate, approximately, the seat of the stenosis by studying the reactions of the afferent and efferent limbs of the bowel.

That contraction of the intestine which is the invariable accompaniment of an obstruction can often in a thin person be seen through the abdominal wall. There is a wave of distention which begins at a distance from and ends at the point of stricture. Careful examination of this wave-like tumor will often show the acute observer in what portion of the abdomen the stenosis is situated. If the stricture does not completely close the gut, the passage of fluids or semifluids and gas through the narrowed portion is announced by a gurgle, which is most distinct over the seat of trouble.

The location, then, of the end of the abdominal wave and of the loudest gurgle will in many patients enable us to locate the seat of disease.

We may also locate it by watching the effect of a large high enema in the efferent bowel, for, if an enema of water were pumped into the colon in sufficient quantity to dilate it, we should find that the distention would occupy only that portion of the bowel below the stricture. Distention with gas would answer the same purpose. In very fat persons, the phenomena thus caused are not so perceptible, and in some cases complications of any kind might obscure the diagnosis. Indeed, careful and repeated examinations can alone give that surety in such cases which would warrant the surgeon in directing his operation by his diagnosis.

If the tumor can be even approximately located, the abdomen should be opened directly over it. If that is impossible, the exploratory incision should be made in the median line. The tumor or stricture having been found, the coil in which it is seated should be drawn out of the abdomen, and, if necessary for this purpose, adhesions should be broken or cut, enlarged mesenteric glands should be then removed, and the mesentery repaired. At this stage, the two limbs of the intestine leading to and from the tumor, at a sufficient distance from the seat of disease, should be joined together by Lembert sutures and an anastomosis made with an elastic ligature. If the exploratory opening in the abdomen should seem best adapted for the purpose, the wound should now be closed snugly around the protruding coil, the ligatured portion remaining in the abdominal cavity, and the tumor, with a length of gut of two or three inches, outside of the abdomen. If the exploratory incision is made in the median line and the tumor is found to exist at either angle of the colon, it would be better to close the median incision and make a new one over the tumor, just large enough to permit of its easy exit. In every case the tumor should be drawn out of the abdomen at that point which would most nearly permit the resected intestine to occupy its normal position. (Fig. 1.)

When the wound has been closed and sutured to the protruding intestine, a firm silk ligature should be tied around the efferent limb just below the tumor and the gut cut off below it, care being taken that not the least portion of its contents is allowed to come in contact with the wound. This part of the gut is small, contains little fæces, and is easily cleansed and disinfected. It may now be closed with a circular suture, inverted into itself, and pushed in until its outer surface no longer projects beyond the level of the skin. (Fig. 2.) A few Lembert sutures will now hold it in position and the integument may be brought over it and sutured. In this way the efferent limb is, once and for all, disposed of.

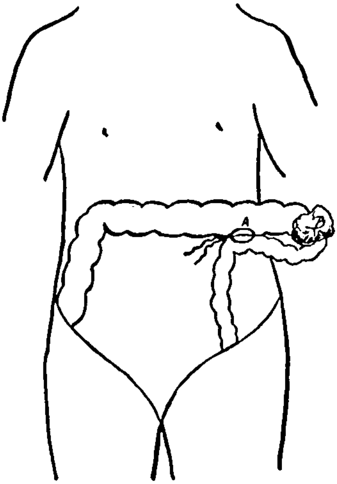

Fig. 1.—Cancer of colon at splenic flexure. *A*. Anastomosis made by elastic ligature between the afferent and efferent limbs of the colon. *B*. The cancer, which has been drawn out of the abdomen through a lateral incision.

When the gut is divided just below the ligature, the afferent distended portion should be seized by an attendant and wrapped in gauze. As soon as the efferent limb has been hidden under the integument, the surgeon should examine carefully the sutured line which fastens the proximal bowel to the integument, and see that the abdomen is thoroughly closed.

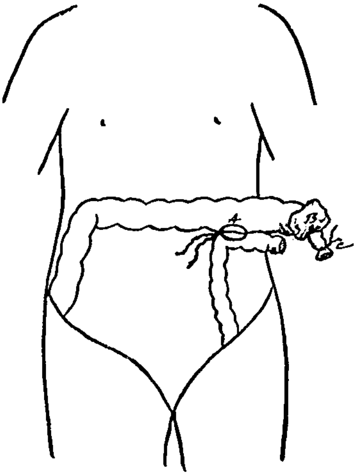

FIG. 2.—A ligature has been tied around the efferent limb at *c*, and the bowel divided below it

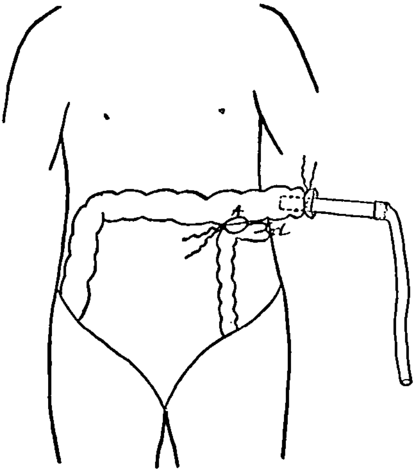

FIG. 3.—The divided end of the efferent limb has been inverted at *d* and the skin sutured over it. The cancer has been removed, and a glass tube inserted into the proximal end of the colon for the evacuation of fæces.

Layers of gauze soaked in collodium should then be placed over the whole wound so as to seal it hermetically. A large trocar, such as has been used for the discharge of fluids from ovarian cysts, in operations for the removal of those tumors, may now be thrust into the intestine and the fæces discharged. A rubber tube attached to the trocar will carry them into a proper receptacle.

When the gut has been thoroughly emptied of fæces, the diseased portion should be cut off and a large glass tube inserted into the bowel and tied in place by an encircling ligature. To this a rubber tube is attached for the disposal of fæces. (Fig. 3.) At the end of four or five days, the fæces will find their way through the new channel of anastomosis and pass into the lower bowel. As soon as this is determined by fæcal discharges per rectum, the tube may be removed, the gut sutured and turned into itself, and the wound in the integument closed over it. (Fig. 4.) In this way we shall have guarded the abdomen from all contamination from the opened bowel, have excised the diseased portion, and made the anastomosis and completed the work in what is practically but one operation, for the final disposal of the proximal end by inversion and suture can hardly be dignified by the name of operation.

It is evident that the success of this procedure will depend upon the success of the entero-enterostomy with the elastic ligature.

It must be remembered that the great distention of the proximal portion of the colon will tend to force a discharge through the smallest aperture. For this reason the rubber ligature must be passed with the greatest care. I should not trust an ordinary needle for this purpose, because, even though the ligature is put on the stretch, it would offer a shoulder which might unnecessarily enlarge the opening made by the needle.

The McLean needle, which I have used in anastomoses of the bowels, does away with the shoulder made by the doubled rubber thread and permits the use of a ligature much larger than itself. Notwithstanding the slight shoulder caused by its ferrule, it is an excellent instrument. The Smith needle is absolutely free from all shoulder and answers the purpose admirably. If the large-sized rubber is used with this needle, it can be passed while on the stretch, and will immediately expand beyond the size of the aperture, filling it completely.

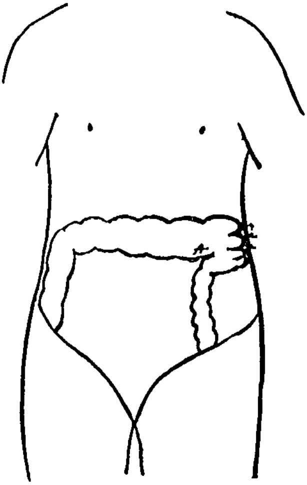

FIG. 4.—The anastomosis at *A* has been completed, and the end of the proximal limb has been inverted. The skin has been sutured over the intestine.

The thickest portions of the large intestine are those occupied by the longitudinal bands, and these should be chosen for the passage of the needle, as the danger of any extravasation would be diminished thereby to the uttermost. This operation may be used on all forms of intestinal stenosis.